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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/072,126	02/07/2002	Brian Thomas Berkowitz	MS172076.1/40062.161US01	2555

7590   03/23/2004

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EXAMINER
HO, THANG H

ART UNIT	PAPER NUMBER
2188	

DATE MAILED: 03/23/2004

4

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

	Application No.	Applicant(s)
Office Action Summary	10/072,126	BERKOWITZ ET AL.
	Examiner	**Art Unit**
	Thang H Ho	2188

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>05 January 2004</u>.

2a)☒ This action is **FINAL**.   2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) <u>1-32</u> is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) <u>1-14, 23-25 and 27-32</u> is/are rejected.

7)☒ Claim(s) <u>15-22 and 26</u> is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All   b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☐ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.

4)☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.

5)☐ Notice of Informal Patent Application (PTO-152)

6)☐ Other: _____.

DETAILED ACTION

Response to Amendment

1.   This Office Action is in response to applicant's amendment dated January 5, 2004. The

applicant's remarks and amendment were considered with the results that follow.

2.   Claims 1-32 are pending in this application for examination. Claims 1-9, 11-28 and 30

have been amended, no claim has been cancelled and no new claim has been added. Therefore,

claims 1-32 remain pending in the application.

3.   The objection to claim 1 is withdrawn due to the Amendment filed on January 5, 2004.

Claim Rejections - 35 USC § 102

4.   The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the

basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on
> sale in this country, more than one year prior to the date of application for patent in the United States.

5.   Claims 1-5 and 9-10 are rejected under 35 U.S.C. 102(b) as being anticipated by Tamer et

al. (USPN: 6,035,412), hereinafter Tamer.

        As per **claim 1**, Tamer discloses a method of transporting data from a sending

host computer system to a receiving host computer system, the data being stored on a

volume of information, the method comprising:

        o   creating a point-in-time copy of the volume [(Figure 1A)];

o generating a backup components document, wherein the backup components

document includes location information related to the point-in-time copy

[(Figure 1A, element 7, column 8, lines 34-50 *"... controller also generates an*

ordered list... ", Figure 4A, step 104, column 10, lines 50-52 *"The backup*

console passes the list of datafiles to the backup server... ")];

o importing the backup components document to the receiving host computer

system [(Figure 4A, step 106), column 10, lines 52-55 *"...the backup server...*

imports... "]; and

o accessing point-in-time copy using the location information in the backup

components document [(Figure 4A, step 108, column 10, lines 55-57 *"...the*

backup server starts the backup session... ")].

As per **claim 2**, Tamer discloses a method as defined in claim 1 wherein the

backup components document comprises: a self-contained description of where the point-

in-time copy resides and how the point-in-time copy is to be restored [(column 8, lines

35-37 *"Each entry... identifies a volume ... and a particular tracks within that volume. "*)].

As per **claim 3**, Tamer discloses a method as defined in claim 2 wherein the

backup components document further comprises: a description of physical resources

necessary to restore and access the point-in-time copy [(column 8, lines 35-37 *"Each*

entry... identifies a volume ... and a particular tracks within that volume. ")].

As per **claim 4**, Tamer discloses a method as defined in claim 1, wherein the volume is one a plurality of volumes stored on a plurality of LUNs, the method further comprising:

- o identifying the plurality volumes to be copied and transported [(Figure 1A, elements 3 and 5, column 2, lines 30-33 *"The method further includes... data storage systems with a plurality of data storage volumes..."*, Figure 4A, step 102, column 10, lines 43-57)];

- o wherein the creating act comprises creating a point-in-time copy of the plurality of volumes [(Figure 4A, step 108, columns 10, lines 55-57)] ;

- o importing the point-in-time copy of the plurality of volumes onto the receiving host computer system [(Figure 4A, step 106)]; and

- o reconstructing information relating to mapping information associated with the plurality of volumes the point-in-time copy volumes of the plurality of volumes [(Figure 4A, step 106)].

As per **claim 5**, Tamer discloses a method as defined in claim 4 further comprising:

- o following the act of identifying a the plurality of volumes to be copied and transported and prior to the act of creating the point-in-time copy of the plurality volumes, determining the plurality of LUNs that compose the plurality of volumes [(Figure 3, column 7, lines 62-column 8, lines 33-37)];

- o polling a plurality of providers in the network environment to determine whether the plurality of LUNs that compose the plurality of volumes are supported [(*It is interpreted that polling for a provider capable of supporting LUNs is inherent in order to support data mirroring between volumes*)];

- o determining one provider that supports the plurality of LUNs that compose the plurality of volumes to create the point-in-time copy of the plurality of volumes [(*It is interpreted that polling for a provider capable of supporting LUNs is inherent in order to support data mirroring between volumes*)]; and

- o instructing the provider that supports the plurality of LUNs that compose the plurality of volumes to create the point-in-time copy of the plurality of volumes [(Figure 4A, step 108, column 10, lines 55-57 *"... the backup server starts the backup session... ")*].

As per **claim 9**, Tamer discloses a method as defined in claim 1 wherein the volume is stored on at least a portion of one or more LUNs, the method further comprising:

- o storing the original state of portions of the one or more LUNs to be copied [(Figure 4A, steps 102 *"....break the SRDF link.... enable R2 devices")*];

- o opening a volume handle to allow marking of the volume [(Figure 4A, step 106 *"...enables volume group... ")*];

o marking portions of the one or more LUNs to identify the portions as being

associated with the volume [(column 9, lines 8-10) *"Prior to cutting the link...*

the slave unit is not W enabled."];

o creating the point-in-time copy of each one of the one or more LUNs having a

portion of the volume [(Figure 4A, step 108, column 10, lines 55-57 *"... the*

backup server starts the backup session...")];

o closing the volume handle [(Figure 4A, step 112 *"...disables volume group...*

")]; and

o restoring the volume to its original state [(Figure 4A, steps 114 *"... Disable R2*

devices... Resume link")].

As per **claim 10**, Tamer discloses a method as defined in claim 9 wherein the act

of closing the volume handle is caused by a system crash [(It is inherent that the volume

handle will closed in an event of a system crash)].

Claim Rejections - 35 USC § 103

6.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in
> section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are
> such that the subject matter as a whole would have been obvious at the time the invention was made to a person
> having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the
> manner in which the invention was made.

7.   Claims 11 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tamer

et al. (USPN: 6,035,412).

As per **claims 11 and 14**, Tamer teaches the method as claimed. However, Tamer does not particularly teach the backup component document comprising an XML document.

Nevertheless, it is well known in the art that XML are commonly used for its portability and the ability to define custom set of tags including tags representing data description or data relationships providing advanced searching. Furthermore, XML separates document structure from content from presentation thereby improving user response, network load, and server load.

Accordingly, it would have been prima facie obvious for one skilled in the art at the time the invention was made to implement the method as taught by Tamer and to implement backup document as XML document to generate the claimed invention with a reasonable expectation of success for the reasons set forth above.

8.   Claims 6-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tamer et al. (USPN: 6,035,412) in view of Hall (US-PGPUB 2001/0016904).

As per **claims 6-8**, Tamer teaches a method as defined in claim 1 wherein the volume is stored on at least a portion of one or more LUNs, the method further comprising:

   o   marking portions of the one or more LUNs to identify the portions as being associated with the volume [(Figure 1A, elements 5 and 7, column 7, lines 62-64 *"The bit maps are used to identify..."*, column 8, lines 33-37 *"... controller also generates an ordered list 7 of modified tracks. Each entry in the ordered list 7 indentifies a volume... and a particular track within that volume."*)];

     o   creating a point-in-time copy of each of the one or more LUNs having a

portion of the volume [(Figure 4A, step 108, column 10, lines 55-57 *"... the*

backup server starts the backup session...")]; and

     o   evaluating the marked portions of the point-in-time copies of the one or more

LUNs [(column 10, lines 14-29 *"So when the link is reestablished,... the*

corresponding bits are cleared.")]; and

     o   marking the portions being associated with the volume to be transported as

read-only [(column 9, lines 8-10) *"Prior to cutting the link... the slave unit is*

not W enabled."].

However, Tamer does not teach the hiding of portions of the point-in-time copy

LUNs not associated with the volume to be transported.

Hall teaches a method for masking LUN in a shared data storage system to hide

the masked LUNs from the operating system to facilitate controlling access of LUNs

within a shared data storage system [(column 1, 4th paragraph *"There are two*

approaches... Masked LUNs are hidden from the operating system.")].

Accordingly, it would have been prima facie obvious for one skilled in the art at

the time the invention was made to implement the method as taught by Tamer and to

utilize Hall's LUNs masking technique to mark the associated and unassociated portions

accordingly to generate the claimed invention with a reasonable expectation of success

for the reasons set forth above.

9.   Claims 23-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tamer et al.

(USPN: 6,035,412) in view of Fujibayashi (US-PGPUB: 2003/0131278).

As per **claims 23-24**, Tamer teaches the method as defined in claim 1 as claimed. However, Tamer does not specifically teach the method for deleting one point-in-time copy of one of the plurality of volumes while maintaining at least one other point-in-time copy volume.

Fujibayashi teaches the method for deleting one of the point-in-time copy of the plurality of volumes while maintaining at least one other point-in-time copy of the plurality of volumes to allow fast restoration of the point-in-time copy volume [(page 2, paragraph 23 *"Control manager engine 200... enables a user to select the snapshot volumes to use (and therefore which snapshots to delete)..."*).

Accordingly, it would have been prima facie obvious for one skilled in the art at the time the invention was made to implement the method as taught by Tamer and to implement deletion of a copy of point-on-time copy volumes while maintaining the other volumes as taught by Fujibayashi to generate the claimed invention with a reasonable expectation of success for the reasons set forth above.

10.   Claims 12-13 and 25-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tamer et al. (USPN: 6,035,412) in view of Tzelnic et al (USPN: 6,366,987), hereinafter Tzelnic.

As per claims **12-13 and 25-27**, Tamer teaches a method as defined in claim 1 as claimed. However, Tamer teaches neither the method for identifying and requesting information relating to each of the LUN copies nor the method for storing the encoded instructions for executing the method on a computer readable medium.

Tzelnic teaches the method for identifying LUN copies to physical storage translation allowing fast restoration of data in an event of a storage system failure [(Abstract, column 11, lines 64 et seq.)].

Tzelnic further teaches a computer readable medium carrying computer-executable instructions for implementing the claimed method to facilitate the transporting and installing of the method on other systems [(column 29, lines 39-65 *"25. A machine readable program..."*)].

Accordingly, it would have been prima facie obvious for one skilled in the art at the time the invention was made to implement the method as taught by Tamer and to utilize Hall's LUNs masking technique to mark the associated and unassociated portions accordingly and to implement the method on a computer readable medium to generate the claimed invention with a reasonable expectation of success for the reasons set forth above.

11.   As per claims 28-32, the claims encompass the same scope of invention as to that of claims 1-9, however the claims are drafted as apparatus format rather than method format, the claims are therefore rejected for the same reasons as being set forth above.

Allowable Subject Matter

12.   Claims 15-22 and 26 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Response to Arguments

13.   Applicant's arguments filed on January 5, 2004 with respect to claims 1-14, 23-25 and

27-32 have been fully considered but they are not persuasive.

Applicants asserted:

  (a) Tamer does not teach or suggest in any manner creating a copy of a volume of

      data and then using the ordered list to identify a location for accessing the copied

      volume of data, as recited in claim 1.

  (b) The rejections of claims 28-32 are improper.

Examiner respectfully traverses Applicant's remarks for the following reasons:

        With respect to (a), Tamer clearly teaches the use of BIT MAPS 5 and LIST 7 as

backup components document as shown in Figure 1, column 8, lines 34-51, wherein BIT

MAPS 5 and LIST 7 contains location information (i.e., location of modified tracks

among the plurality of volumes), which allows the identification to be used to access a

volume being backed up and its point-in-time copy (i.e., the paired volumes) to obtain

synchronization among the volumes. Additionally, Tamer teaches the use of archived

redo logs as backup components document, which allows the identification and accessing

of the point-in-time copied volumes allowing the partial or complete restoration of the

point-in-time copied data (e.g., see Figure 5, column 11, line 59 through column 12, line

63). Furthermore, with respect to the amended claims 7-8, wherein the amended claims

only require the hiding or marking one or more LUNs as read only, Tamer alone teaches

the marking of one or more LUNs as read only as detailed above with respect to claims 7-

8.

With respect to (b), claims 28-32 are directed to a system comprising required apparatus for performing the steps of claims 1-9. For example, claim 1 recites a point-in-time copying method whereas claim 28 recites the system for implementing the method of claim 1. Therefore, claims 28-32 encompass the same scope of invention as to that of claims 1-9.

Therefore, the rejection of claims 1-14, 23-25 and 27-32 is deemed to be proper. The teachings of Tamer, Fujibayashi, Hall and/or Tzelnic, taken alone or in concert, disclose each and every element recited within claims 1-14, 23-25 and 27-32.

Conclusion

14.   **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time

policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE

MONTHS from the mailing date of this action. In the event a first reply is filed within

TWO MONTHS of the mailing date of this final action and the advisory action is not

mailed until after the end of the THREE-MONTH shortened statutory period, then the

shortened statutory period will expire on the date the advisory action is mailed, and any

extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the

advisory action. In no event, however, will the statutory period for reply expire later than

SIX MONTHS from the mailing date of this final action.

15.   Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Thang H Ho whose telephone number is 703-305-1888. The

examiner can normally be reached on Monday-Friday from 7:00 A.M. - 4:30 P.M..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Mano Padmanabhan can be reached on 703-306-2903. The fax phone number for the

organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding

should be directed to the receptionist whose telephone number is 703-305-9600.

Thang Ho
Art Unit 2188
March 18, 2004